

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Previously Presented) A method for managing data in a memory device having a plurality of blocks, comprising the steps of:

maintaining a first vector having block entries sorted in order of number of overall block modifications for each block of the plurality of blocks;

maintaining a second vector having block entries sorted in order of number of block modifications since a previous wear-leveling event;

using the first vector and the second vector to determine which of the plurality of blocks should have its associated data relocated to another block;

wherein the using step comprises the steps of:

(i) determining which of a first given block associated with an entry in the first vector and a second given block associated with an entry in the second vector is more physically worn;

(ii) determining which of the first given block and the second given block is more active;

(iii) if either one of the first given block and the second given block are both the more physically worn block and the more active block, updating a swap table to indicate that contents of the first given block should be swapped with contents of the second given block;

(iv) repeating steps (i) - (iii) for each block entry in at least the first vector;

(v) re-sorting the second vector such that the blocks associated with the block entries contained therein are sorted in order of number of block modifications since a previous wear-leveling event;

(vi) repeating steps (i) - (iv) for the re-sorted second vector;

(vii) swapping blocks according to the swap table; and

wherein in step (v) the second vector is sorted in reverse order from the order in which it was originally sorted in and, in addition, the first vector is also re-sorted in reverse order from the order in which it was originally sorted in.

2. (Original) The method of Claim 1, wherein the first vector is sorted in descending order of overall block usage and the second vector is sorted in ascending order of block usage since the previous wear level event.
3. (Original) The method of Claim 1, wherein the first vector is sorted in ascending order of overall block usage and the second vector is sorted in descending order of block usage since the previous wear level event.
4. (Original) The method of Claim 1, wherein the block entries for the first and second vectors each comprise a pointer to a block descriptor for each of the plurality of blocks.
5. (Original) The method of Claim 4, wherein each said block descriptor maintains a modification count for its respective block.
6. (Original) The method of Claim 5, wherein the modification count comprises a count of total overall modifications (n count) for its respective block and total modifications since a previous wear-leveling event (Δn count) for the respective block.
7. (Original) The method of Claim 6, wherein the n count for a first given block in the first vector is compared to the n count for a second given block in the second vector to determine which of the first and second blocks is more physically worn, and wherein the Δn count for the first given block in the first vector is compared to the Δn count for the second given block in the second vector to determine which of the first and second blocks is more active, and further comprising the step of swapping contents of the first given block with the second given block if either of the first given block and second given block are both the more physically worn block and the more active block.
8. (Original) The method of Claim 1, wherein the using step comprises the step of copying data contained in a block having higher usage to a block having lower usage.

9. (Original) The method of Claim 8, further comprising the step of copying data contained in a block having lower usage to a block having higher usage.

10. (Original) The method of Claim 1 wherein the block modifications are at least one of erasing blocks and writing blocks.

11. (Original) The method of Claim 1, wherein the step of using the first vector and the second vector comprises the steps of:

determining which of a first given block associated with an entry in the first vector and a second given block associated with an entry in the second vector is more physically worn;
determining which of the first given block and the second given block is more active;
and

swapping contents of the first given block with contents of the second given block if either of the first given block and the second given block are both the more physically worn block and the more active block.

12. (Original) The method of Claim 11, wherein the more physically worn determining step and the more active determining step are repeated for a plurality of blocks associated with entries in the first and second vectors, and wherein the swapping step is deferred until each of the plurality of blocks associated with each of the first and second vectors have been processed.

13. (Canceled)

14. (Canceled)

15. (Previously Presented) A system for managing data in a memory device having a plurality of blocks, comprising:

a first vector having block entries sorted in order of number of overall block modifications for each block of the plurality of blocks;

a second vector having block entries sorted in order of number of block modifications since a previous wear-leveling event;

means for using the first vector and the second vector to determine which of the plurality of blocks should have its associated data relocated to another block;

wherein the using comprises:

(i) means for determining which of a first given block associated with an entry in the first vector and a second given block associated with an entry in the second vector is more physically worn;

(ii) means for determining which of the first given block and the second given block is more active;

(iii) means for if either one of the first given block and the second given block are both the more physically worn block and the more active block, updating a swap table to indicate that contents of the first given block should be swapped with contents of the second given block;

(iv) means for repeating (i) - (iii) for each block entry in at least the first vector;

(v) means for re-sorting the second vector such that the blocks associated with the block entries contained therein are sorted in order of number of block modifications since a previous wear-leveling event;

(vi) means for repeating (i) - (iv) for the re-sorted second vector;

(vii) means for swapping blocks according to the swap table; and

wherein in means for (v) the second vector is sorted in reverse order from the order in which it was originally sorted in and, in addition, the first vector is also re-sorted in reverse order from the order in which it was originally sorted in.

16. (Original) The system of Claim 15, wherein the first vector is sorted in descending order of overall block usage and the second vector is sorted in ascending order of block usage since the previous wear-leveling event.

17. (Original) The system of Claim 15, wherein the first vector is sorted in ascending order of overall block usage and the second vector is sorted in descending order of block usage since the previous wear-leveling event.

18. (Original) The system of Claim 15, wherein the first and second vectors each comprise a pointer to a block descriptor for each of the plurality of blocks.

19. (Original) The system of Claim 18, wherein each said block descriptor maintains a modification count for each of the plurality of blocks.

20. (Original) The system of Claim 19, wherein the modification count comprises a count of total overall modifications (n count) for its respective block and total modifications since a previous wear-leveling event (Δn count) for the respective block.

21. (Original) The system of Claim 20, wherein the n count for a first given block in the first vector is compared to the n count for a second given block in the second vector to determine which of the first and second blocks is more physically worn, and wherein the Δn count for the first given block in the first vector is compared to the Δn count for the second given block in the second vector to determine which of the first and second blocks is more active, and further comprising the step of swapping contents of the first given block with the second given block if either of the first given block and second given block are both the more physically worn block and the more active block.

22. (Original) The system of Claim 15, further comprising means for copying data contained in a block having higher usage to a block having lower usage.

23. (Original) The system of Claim 22, further comprising means for copying data contained in a block having lower usage to a block having higher usage.

24. (Original) The system of Claim 15 wherein the block modifications are at least one of erasing blocks and writing blocks.

25. (Original) The system of Claim 15, wherein the means for using comprises:

first means for determining which of a first given block associated with an entry in the first vector and a second given block associated with an entry in the second vector is more physically worn;

second means for determining which of the first given block and the second given block is more active; and

means for swapping contents of the first given block with contents of the second given block if either of the first given block and the second given block are both the more physically worn block and the more active block.

26. (Previously Presented) A data storage subsystem comprising a memory controller, system memory and a plurality of flash devices, each flash device organized as a plurality of blocks, wherein the memory controller operates to perform the steps of:

maintaining a first vector having block entries sorted in order of number of overall block modifications for each block of the plurality of blocks;

maintaining a second vector having block entries sorted in order of number of block modifications since a previous wear-leveling event;

using the first vector and the second vector to determine which of the plurality of blocks should have its data located to another block;

wherein the using step comprises the steps of:

(i) determining which of a first given block associated with an entry in the first vector and a second given block associated with an entry in the second vector is more physically worn;

(ii) determining which of the first given block and the second given block is more active;

(iii) if either one of the first given block and the second given block are both the more physically worn block and the more active block, updating a swap table to indicate that contents of the first given block should be swapped with contents of the second given block;

(iv) repeating steps (i) - (iii) for each block entry in at least the first vector;

(v) re-sorting the second vector such that the blocks associated with the block entries contained therein are sorted in order of number of block modifications since a previous ear-leveling event;

(vi) repeating steps (i) - (iv) for the re-sorted second vector;

(vii) swapping blocks according to the swap table; and

wherein in step (v) the second vector is sorted in reverse order from the order in which it was originally sorted in and, in addition, the first vector is also re-sorted in reverse order from the order in which it was originally sorted in.

27.-39. (Canceled)